

Summary of Changes (v21.08):

1. Revise paragraph 1.06 A, 5 year to 5-year.
2. Revise paragraph 1.06 B, 10 year to 10-year.
3. Revise paragraph 1.06 B, delete warranty against failure due to high wind conditions (50 mph or less).
4. Revise paragraph 1.06 C, 5 year to 5-year.

**Finish Hardware
TECHNICAL GUIDE**

TG 08710

1. COORDINATION ISSUES:

- 1.1 Coordinate finish hardware with other technical sections, details, and project requirements.
- 1.2 When disapproval of a finish hardware substitution is necessary, the A/E must provide specific reasons for the disapproval. Obtain DAGS [Inspection-Construction Management](#) Branch or District Office concurrence before recommending disapproval of a contractor's hardware submittal. If substitutions are disallowed during the bidding phase immediately provide specific justification to the DAGS Project Management Branch Project Coordinator.

2. DESIGN ISSUES:

- 2.1 Problem:
 - 2.1.1 The astragals on a double door can conflict with the active leaf lockset strike lip.
 - 2.1.2 Overhead door coordinators on double doors with astragals can conflict with the closer housing/mounting plate on either leaf.
- 2.2 Recommendations:
 - 2.2.1 In consultation with the specified hardware supplier assure that the strike and closer mounting plate are designed for application to a double door with astragal and coordinator.
 - 2.2.2 AVOID:
 - 2.2.2.1 Specifying a proprietary hardware manufacturer and model. Preferably the product must be available from 3 suppliers, but at least 2. When this is not possible, obtain DAGS Project Coordinator's prior acceptance and approval of what will be a restrictive specification; DAGS to complete SPO Form-14, Request for Restrictive Specification.
 - 2.2.2.2 Disapproving the Contractor's door hardware substitution request when the substitute device is equal or better than the hardware brand and model listed in the contract specifications
 - 2.2.2.3 Limiting competition by listing hardware brands in the specifications which are all owned by the same parent company. For example: Schlage, Falcon, Monarch, etc. brands are owned by Ingersoll Rand. Sargent, Yale, Corbin Russwin, etc. brands are owned by Assa Abloy. Ensure hardware competition exists for the listed brands among the local hardware suppliers.
 - 2.2.2.4 Providing de-facto proprietary specifications when the existing lockset master keying can only be matched by one lockset brand. (If only one brand can match the existing master key system, notify the Project Coordinator. Approval for a Sole Source procurement (SPO Form-1) may be required from the State Procurement Office).
 - 2.2.2.5 Requiring salient hardware features which cannot be provided by at least 2 local suppliers.

- 2.2.2.6 Requiring features which are not salient to the device's function. The following features are not considered required features:
- a. Door closers: With or without pressure relief valves.
 - b. Panic exit devices: With all stainless steel or optional aluminum base metal construction.
- 2.3 Proprietary or Restrictive Specifications: To avoid inadvertently specifying proprietary hardware devices, consult with at least 2 of the local hardware manufacturer's representatives or suppliers to ensure that open competition exists.
- 3. DRAWING NOTES:** (Not Used)
- 4. STANDARD DRAWINGS:** (Not Used)
- 5. SPECIFICATION NOTES:**
- 5.1 Due to recurring maintenance and security problems involving door hardware (on both CIP and Repair and Maintenance projects), the consultant shall address the following items in preparing the contract documents:
- 5.2 Condition of the existing doors, door frames and hardware to remain.
- 5.2.1 Where patching is necessary, patching compounds shall not be used. The patch shall consist of wood plugs secured with permanent adhesives.
- 5.2.2 Where existing hardware is to be retained and installed on new doors, ensure that the hardware is in proper operating condition and are properly installed so that the operation of the door is not adversely affected.
- 5.3 Hardware:
- 5.3.1 Exterior doors shall have locks classified with free-wheeling levers which are multiple times Grade 1 standards.
- 5.3.2 The latest manufacturer's product data shall be used to ensure that the latest up-to-date models are used. Be sure not to mix-up model numbers between the various manufacturers.
- 5.3.3 Products which are not locally stocked or serviced, or which must be "special ordered" are not acceptable for typical hardware items.
- 5.3.4 Floor mounted bumpers and stops are easily kicked loose and are a potential tripping hazard. Where door bumpers/stops are used, they should be wall mounted where practical. Where use of floor mounted bumpers is unavoidable address the maintenance and hazard issues in the design and placement of bumpers.
- 5.3.5 Where floor mounted door stops / bumpers are provided, they shall be secured to the substrate using fasteners or stainless steel inserts shall be installed onto which the stop / bumper can be secured to using theft-resistant fasteners. The top plate of the insert shall be flush with the top of the floor finish.
- 5.4 Keying:
- 5.4.1 Identify which locks are to be "keyed-alike". (Coordinate requirements with the user through the Project Coordinator.)
- 5.4.1.1 Multiple doors leading into the same room shall be keyed-alike.
- 5.4.1.2 Secondary rooms within a larger room shall be keyed-alike.

- 5.4.1.3 In matching existing keyways, use of the original manufacturer's cylinders will be required
- 5.4.2 Identify which locks are to be keyed separately. (Coordinate requirements with the user through the Project Coordinator.)
- 5.4.3 Depending on the existing door lock brand, some lock brands cannot match the existing master key. Therefore, requiring a match of the existing master key system may result in limiting competition. Seek, if practical, means to open competition by specifying the following on projects where the new keys are an extension of a single key system:
 - 5.4.3.1 Allow the Contractor the option of replacing the cylinders of the existing locksets, at no cost to the State, in order to provide one master key system. This will allow for more open competition.
- 5.5 Substitutions: When evaluating proposed hardware substitutions, make sure that the physical and operational characteristics, construction, performance requirements, etc. of the proposed product is equivalent to or exceeds those of the specified product. Where necessary, request submittal of actual samples so a visual comparison can be made. Examples of items to check are as follows:
 - 5.5.1 Diameter of the door stop "stem" supporting the rubber bumper.
 - 5.5.2 Accessibility of closer adjustment valves.
 - 5.5.3 Thickness and width of closer arms.
 - 5.5.4 Thickness of threshold extrusions
 - 5.5.5 Contractor's Substitution Request: Obtain concurrence from the DAGS Project Coordinator/Contracting Officer prior to recommending disapproval of a door hardware substitution request.
- 5.6 Hardware Types: The TG specification contains materials typically used in DAGS projects. Delete items not used in project for which the section will be used. Add paragraphs for items such as:
 - 5.6.1 Electrified locks and latches.
 - 5.6.2 Power-Assist closers.
 - 5.6.3 Sliding door hardware.
 - 5.6.4 Folding door hardware.
 - 5.6.5 Pivots.
 - 5.6.6 Closer holder release devices.
 - 5.6.7 Key control systems.
- 6. GUIDE SPECIFICATION**
 - 6.6.1 Section 08710 Finish Hardware.

SPECIFIER'S NOTE: Blue colored italicized text is used for notes to the specifier and should be completely deleted from the final text. Where [Red colored italicized text in parentheses] is shown in this specification section, insert wording, numbers, etc. as appropriate and delete parentheses. Where <Red colored text in brackets> is shown, a

choice is indicated. Make the appropriate choice and delete the brackets. Maintain footer notation with the current version used (e.g. TG08710 v06.08). Verify that section titles cross referenced in this Section correspond to this Project's specifications; Section titles may have changed.

END OF SECTION

SECTION 08710 - FINISH HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide all finishing hardware required for all doors and cabinet work, complete as specified.
- B. It is the intent of this Specification to cover in general the class and character of all finish hardware required.
- C. The hardware list specified has been made for the convenience of the Contractor and covers in general the necessary hardware for doors, casework, etc., but all other doors, etc., shown on the Drawings and not covered by the general characterization shall be fitted with appropriate hardware of the same standards as the hardware described throughout these specifications. Contractor shall furnish hardware schedule as specified.
- D. Suppliers proposing substitutes of equivalent products of other than the manufacturers named shall submit schedules listing the product and manufacturer specified and the product and manufacturer of proposed substitute. This schedule shall be submitted in accordance with the GENERAL CONDITIONS.

SPECIFIER'S NOTE: Add other related work and modify as required. Hardware for aluminum entry doors is usually specified with the door and the cylinder lock specified here.

- E. Related Work Described Elsewhere:
 - 1. Door silencers are provided under Section 08110 – STEEL DOORS AND FRAMES.
 - 2. Provide cylinders for doors provided under Section 08410 – ALUMINUM ENTRY DOORS AND WINDOW WALL.
 - 3. Coordinate the work with other directly affected sections involving manufacturer or fabrication of internal reinforcement for door hardware.

1.02 SUBMITTALS

- A. Submit in accordance with SECTION 01330 - SUBMITTAL PROCEDURES.
- B. Door Hardware Schedule: Furnish copies of the schedule of hardware in compliance with specifications and Drawings. Schedule format shall be vertical type as listed in DHI document "Sequence and Format for the Hardware Schedule". List each opening using same door numbers as shown and hardware to be applied. State materials finish, and manufacturer's number for each item. Required types are listed. Double space entries and number and date each page. Include the following information:
 - 1. Identification number, location, hand, fire rating and material of each door and frame.
 - 2. Type, style, function, size, quantity and finish of each door hardware item.
 - 3. Complete designations of every item required for each door opening including name and manufacturer.
 - 4. Fastenings and other pertinent information.
 - 5. Location of each door hardware set, cross referenced to the Drawings, both on floor plans and in door schedules.
 - 6. Explanation of abbreviations, symbols, and codes contained in the schedule.

7. Mounting locations for door hardware.
 8. Door and frame sizes and materials
 9. List of related door devices specified in other Sections for each door and frame.
- C. **Manufacturer's Data:** Submit manufacturer's descriptive literature along with schedule.
 - D. **Keying Schedule:** Submit a keying schedule prepared by or under the supervision of the Architectural Hardware Consultant detailing State's final keying instructions for locks for approval by the Contracting Officer; using keying nomenclature as listed in DHI document "Keying Terminology". Door designation listed in the Keying Schedule shall be same as those used on Drawings and Hardware Schedule. Include schematic keying diagram. Keying of locks shall be as directed by the Contracting Officer.
 - E. **Tools and Maintenance Instructions:** Furnish a complete set of special wrenches, tools, maintenance instructions applicable to each different or special hardware component, but not less than the number supplied with the finish hardware materials.
 - F. **Certification:** After completion and inspection by hardware supplier or manufacturer's representative of all construction work, certify on an approved form, that all items of finish hardware have been adjusted and are working properly and factory assembly of all locks and cylinders as well as master keying of all locks and cylinders.
 - G. **Warranty:** Submit written warranty as specified in paragraph entitled "WARRANTY" herein below.

1.03 QUALITY ASSURANCE

- A. Perform work in accordance with current ICBO UBC, as amended, NFPA 80 for fire doors, and NFPA 101 for exit doors as applicable. Required hardware shall bear the label of Underwriters Laboratories, Inc. and be listed in the current UL Building Materials Directory or labeled and listed by another testing laboratory acceptable to the Contracting Officer.
- B. **Manufacturer:** Company specializing in manufacturing the Products specified in this section with minimum 3 years documented experience. Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer.
- C. **Hardware Supplier:** Company specializing in architectural finish hardware.
- D. **Hardware Supplier Personnel:** Employ an experienced Architectural Hardware Consultant (AHC), or Contracting Officer accepted equal, who is available at reasonable times during the course of the Work, to the Contracting Officer and Contractor for consultation about Project's hardware requirements, to verify specified hardware with door function and hardware finishes, and to establish keying system.
- E. **Existing Openings:**
 1. Where patching of existing doors and frames is necessary, patching shall be done as directed by the Contracting Officer.
 2. Where new hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide for proper operation.
- F. **Manufacturer's Warranty Response Time:** Complete repair or replacement within 36 hours after being notified by the user. If repair at the site is not possible because the

exact make and model replacement is not available within the specified response time, a temporary substitute of equal quality shall be provided within the specified response time. If a temporary replacement is provided, the permanent repair/replacement response time will be extended to 7 calendar days.

1.04 REGULATORY REQUIREMENTS

- A. Conform to applicable code for accessibility and requirements applicable to fire rated doors and frames.
- B. Definition: "Door Hardware" includes items known commercially as finish hardware which are required for swing and sliding doors, except special types of unique and non-matching hardware specified in same Section as door and door frame.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Delivery, store, protect and handle products to prevent damage of any kind and to maintain security to site.
- B. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.
- C. Deliver individually packaged hardware items at proper times to proper locations (shop or project site) for installation.
- D. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.
- E. Deliver permanent keys as directed by Contracting Officer.
- F. Provide secure lock-up for hardware delivered to project but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the Work will not be delayed by hardware losses, both before and after installation.

1.06 WARRANTY

- A. Locks shall have a minimum ~~5-year~~5-year manufacturer's warranty.
- B. Door closers shall have a minimum ~~10-year~~10-year manufacturer's warranty. ~~Exterior door closers shall have warranty against failure due to high wind conditions (50 mph or less).~~
- C. Panic exit devices shall have a minimum ~~5-year~~5-year manufacturer's warranty.
- D. The Surety shall not be liable for manufacturer's warranty beyond 1 year of the project acceptance date.
- E. Procedure for providing manufacturer warranty is described in General Conditions, article 7.35.3. Contractor shall complete the manufacturer's forms in the name of the Department and submit such forms to the manufacturer within such time as required to validate the warranty/guaranty and submit the forms to the Contracting Officer.

1.07 PROJECT RECORD DOCUMENTS

- A. Record actual locations of installed cylinders and their master key code.

1.08 OPERATION AND MAINTENANCE DATA

- A. Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

- B. The manufacturer's representative shall instruct the User's staff on the hardware's maintenance procedures (type of lubricant needed and frequency of maintenance).

PART 2 - PRODUCTS

2.01 SCHEDULED HARDWARE

- A. Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in HARDWARE GROUPS at end of this Section. Products are identified by using proprietary catalog ~~numbers, and~~ numbers and are used to establish quality and function of products desired.
- B. Product numbers indicated in the HARDWARE GROUPS are those of the manufacturers listed and are used to establish the quality of products intended.
- C. Products listed hereinafter are pre-approved as equals to those products listed in the HARDWARE GROUPS.

2.02 MATERIALS AND FABRICATION

- A. Hand of Door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of indicated door.
- B. Base Metals: Produce hardware units of basic metal and forming method specified, using manufacturer's standard metal alloy, composition, temper and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI A156 series standard for each type hardware item and with ANSI A156.18 for finish designations indicated.
- C. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated. Fasteners exposed to the weather shall be non-ferrous metal or stainless steel.
- D. Furnish appropriate screws for installation, with each hardware item. Provide Phillips flat head screws except as otherwise indicated. Finish exposed screws to match hardware finish. If exposed in surfaces of other work, to match finish of such other work as closely as possible, including prepared-for-paint finish in surfaces to receive painted finish.
- E. Provide concealed fasteners for hardware units which are exposed when door is closed, except to the extent no standard units of the type specified are available with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the Work. In such cases, provide sleeves for each through bolt or use sex screw fasteners.
- F. Expansion shields in concrete or masonry shall fill the depth and diameter of drilled holes.
- G. Bring to the attention of the Contracting Officer any discrepancy between the Hardware Groups and door schedule prior to ordering.

2.03 HINGES

- A. General: Hinges shall conform to ANSI/BHMA A156.1, Grade 1 as a certified product by BHMA and the requirements of this specification.
 - 1. The following hinges will be considered equal subject to project conditions:
 - a. Hager:
 - Type 1: BB1279
 - Type 2: BB1191
 - Type 3: BB1168

Type 4: BB1199

- b. McKinney:
 - Type 1: TA2714
 - Type 2: TA2314
 - Type 3: T4A3786
 - Type 4: T4A3386

- c. Stanley:
 - Type 1: FBB179
 - Type 2: FBB191
 - Type 3: FBB168
 - Type 4: FBB199

- 2. Hinge Application Requirements:
 - a. Exterior Outswing Doors: Type 4 x NRP.
 - b. Exterior Inswing Doors and Vestibule Doors: Type 3 or 4.
 - c. Interior Doors With Closers: Type 1 or 3.
 - d. Interior Doors Over 36 Inches Wide. Type 4.
 - e. Interior Doors 36 Inches or Less Without Closer: Type 1.

B. Templates: Except for hinges to be installed entirely (both leaves) into wood doors and frames, provide only template producing units.

C. Screws: Furnish Phillips flat head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges.

D. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

- 1. Nonferrous Hinges: Stainless steel pins.
- 2. Exterior, Out-swing Doors: Non-removable pins (NRP).
- 3. Interior Doors: Nonrising pins.
- 4. Tips: Flat button and matching plug, finished to match leaves.
- 5. Oil impregnated or ball bearing hinges are acceptable products.

E. Number of Hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90-inches or less in height and one additional hinge for each 30-inches of additional height.

F. Size of hinges shall be as follows:

<u>Door Thickness/Width</u>	<u>Hinge Height</u>	<u>Hinge Width</u>
1-3/4 inches to 36-inches	4-1/2 inches	4-1/2 inches extra heavy ball bearing
1-3/4 inches over 36-inches	5-inches	4-1/2 inches extra heavy ball bearing
1-3/4 inches over 48-inches	5-inches	4-1/2 inches extra heavy ball bearing

Note: Hinge width shall be of sufficient size to clear frame and trim when door swings 180 degrees.

SPECIFIER'S NOTE: Check with user to determine types of existing keying to determine if new locks are to be keyed to a particular keying system. If no keying system exists, delete any particular keying requirement. Re-keying of a building is not normally required unless specifically part of the scope of work.

2.04 LOCK CYLINDERS AND KEYING

- A. [Existing building key system is [_____]]. All locks shall be an extension of this system.] All work, whether new or modification to existing to remain, shall be in compliance with requirements of this Section. Cylinders and cores shall have 6 pin tumblers unless scheduled otherwise. The contractor has the option of replacing the existing lock cylinders, at not additional cost to the State, if needed to create a new master keying system.

SPECIFIER'S NOTE: Check with user to determine if bracketed sentence is required. Purpose of not keying all locks alike in a room is to allow security of items when room used by outside groups.

- B. Provide the number of individual keys equal to not less than 4 times the number of cylinders provided. The number of keys cut to each key cut shall be as directed by the Contracting Officer. All remaining keys shall be blanks. [Locks for Storage Rooms, casework, and cabinets within a room shall be keyed alike but not keyed to the same as the entry door to allow use of the room without full access to all areas.] All locks shall be master keyed and Grandmaster keyed to a single lock system. During period of construction, all locks shall be operated by a special construction master key. Regular day and master keys are to be retained by the Contractor so they cannot be obtained or duplicated by unauthorized persons. All keys shall be stamped "DO NOT DUPLICATE" at the point of manufacture. The special construction master key shall become inoperative when regular keys are turned over to the Contracting Officer. Proper certification of factory assembly of all locks and cylinders and master keying of all locks and cylinders shall be furnished by the Contractor prior to final acceptance of this portion of the work. Certificate shall then be given to the Contracting Officer. Provide 20 [] construction master keys, 6 [] grand master keys, and 6 [] master keys per set.
- C. Removable Core Locks: This project shall require that all locks be provided with removable core locks and construction removable cores. Provide 4 [] control keys for removable cores and [x percent but not less than y] [] extra cores for the State's use.
- D. Keying for cabinetry shall be as provided by manufacturer of hardware. [Key all cabinets in a room alike.]
- E. Upon acceptance of the project, the Contractor shall arrange for temporary keys, obtained from custodian if further access is required.

2.05 LOCKS, LATCHES AND BOLTS

SPECIFIER'S NOTE: First floor exterior locks usually require a deadbolt in addition to lock. Lock functions not made by all manufacturers listed must have a justification for use.

SPECIFIER'S NOTE: The below listed locks are considered the top tier of the ANSI/BHMA Grade 1 locks and recommended for new facilities. Other equal or better competitive locks may be considered. For new projects or where no particular key system is required, use the following paragraph A:

- A. General: Mortise locks and latches shall conform to ANSI/BHMA A156.13, Series 1000, Grade 1 unless Grade 2 is listed; bored locks and latches shall conform to ANSI/BHMA A156.2, Series 4000, Grade 1 unless Grade 2 is listed; auxiliary locks shall conform to

ANSI/BHMA A156.5, Grade 1; bolts shall conform to ANSI/BHMA A156.16, Grade 1; ADAAG and the requirements of this specification.

1. The following mortise locksets and deadbolts will be considered equal:
 - a. Best 38H series, 40H Series.
 - b. Sargent 4800 series, 8200 series.
 - c. Schlage L400 series, L9000 series.

2. The following cylindrical locksets and deadbolts will be considered equal:
 - a. Best 93K series, 83T Series.
 - b. Sargent 10 series, 480 series.
 - c. Sargent 11 series, 480 series.
 - d. Schlage "ND" series, B600 series.

SPECIFIER'S NOTE: The following paragraph applies when either Sargent or Schlage locks are the predominant type of existing locks. The below listed ANSI/BHMA Grade 1 locks will be specified unless a survey of the existing locksets indicate it would be impractical to do so. Survey the quality (grade), age, master key type, make and model of the existing locks to determine whether qualifying the below listed locks are warranted and whether the quality level is appropriate. DAGS prefers specifying the top tier of the Grade 1 hardware unless existing hardware quality and condition warrants specifying a lower quality within ANSI/BHMA Grade 1. Avoid specifying a proprietary lock because other competing brands may not be keyed to match the existing locks. To maximize open competition, under most circumstances the Contractor should be allowed to replace all existing lock cylinders as an option in order to obtain a single master key system when new locks are of a different brand than existing locks. Consult with the DAGS Project Coordinator to determine the best course of action. For existing projects where Best, Sargent, or Schlage is the key system, use the following paragraph A:

- A. General: Mortise locks and latches shall conform to ANSI/BHMA A156.13, Series 1000, Grade 1 unless Grade 2 is listed; bored locks and latches shall conform to ANSI/BHMA A156.2, Series 4000, Grade 1 unless Grade 2 is listed; auxiliary locks shall conform to ANSI/BHMA A156.5, Grade 1; bolts shall conform to ANSI/BHMA A156.16, Grade 1; ADAAG and the requirements of this specification.
 1. The following mortise locksets and deadbolts will be considered equal:
 - a. Best 38H series, 40H Series.
 - b. Sargent 4800 series, 8200 series.
 - c. Schlage L400 series, L9000 series.

 2. The following cylindrical locksets and deadbolts will be considered equal:
 - a. Best 93K series, 83T Series.
 - b. Sargent 10 series, 480 series.
 - c. Sargent 11 series, 480 series.
 - d. Schlage "ND" series, B600 series.

SPECIFIER'S NOTE: See specifier's note above for similar requirements. For existing projects where Corbin Russwin, Yale or Falcon is the key system, use the following paragraph A:

- A. General: Mortise locks and latches shall conform to ANSI/BHMA A156.13, Series 1000, Grade 1 unless Grade 2 is listed; bored locks and latches shall conform to ANSI/BHMA A156.2, Series 4000, Grade 1 unless Grade 2 is listed; auxiliary locks shall conform to ANSI/BHMA A156.5, Grade 1; bolts shall conform to ANSI/BHMA A156.16, Grade 1; ADAAG and the requirements of this specification.
 1. The following mortise locksets and deadbolts will be considered equal:
 - a. Best 38H series, 40H Series.
 - b. Corbin Russwin DL4000 series, ML series.
 - c. Falcon L400 series, M series.
 - d. Sargent 4800 series, 8200 series.

- e. Schlage L400 series, L9000 series.
 - f. Yale 300 series, 8800 series.
2. The following cylindrical locksets and deadbolts will be considered equal:
- a. Best 93K series, 83T Series.
 - b. Corbin Russwin CL3300 series, DL3000 series.
 - c. Corbin Russwin CL3500 series, (interior only)
 - d. Falcon T series, D400 series.
 - e. Sargent 10 series, 480 series.
 - f. Sargent 11 series, 480 series.
 - g. Schlage "ND" series, B600 series.
 - h. Yale 5400L series, 3600 series.
- B. Mortise locksets shall be manufactured in a single sized case formed from 12 gauge minimum steel. The case shall be closed on all sides and back. The lockset shall have a field-adjustable, beveled armored front, with a 0.125-inch minimum thickness.
- C. Mortise locksets shall have freewheeling or breakaway vandal resistant design outside levers on all exterior doors. The freewheeling lever design shall allow the lever to swing freely up to 70 degrees, when the door is locked.
- D. Strikes: Provide manufacturer's standard wrought box strike for each latch of lock bolt, with lip extended to protect frame, finish matching hardware set. Provide dustproof recessed floor strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolts.
- E. Lock Throw:
- 1. Provide 3/4-inch minimum throw of latch and one-inch minimum for deadbolt.
 - 2. Flush Bolt Heads: Minimum of 1/2-inch diameter rods of brass, bronze or stainless steel, with minimum 12-inches long rod for doors up to 7-feet in height; minimum 42-inches long rod for doors up to 9-feet 6-inches in height.
- F. Provide locksets, latches, and cylinders equal in all respects to those specified in the Hardware Groups.

2.06 PANIC EXIT DEVICES

- A. General: Panic exit devices shall conform to ANSI/BHMA A156.3, Grade 1 and the requirements of this section. Exit device vertical rods shall be one piece construction. No splicing will be allowed. Provide recessed floor strikes.
- 1. The following panic hardware will be considered equal:
 - a. Corbin Russwin ED5000, ED4000 series.
 - b. Monarch 18,17 series.
 - c. Sargent 80 series.
 - d. Von Duprin 98, 35 Series.
 - e. Yale 7000 series.

SPECIFIER'S NOTE: Consult with Project Coordinator for specific situations when the above list may not be applicable and should be modified.

- B. All exit devices shall be heavy duty push rail and cast chassis construction.
- C. Exit devices shall have freewheeling or breakaway vandal resistant design outside levers on all exterior doors. The freewheeling lever design shall allow the lever to swing freely up to 70 degrees when the door is locked.
- D. Where panic hardware is to be installed on hollow metal or FRP doors, they shall be mounted with theft resistant through bolts.

2.07 CLOSERS AND DOOR CONTROL DEVICES

- A. General: Closers shall conform to ANSI/BHMA A156.4, Series C02000, Grade 1, with features necessary for the particular application, UL10C listed for fire rated doors, ADAAG, and the requirements of this specification.
 - 1. The following closers will be considered equal for heavy use on exterior doors:
 - a. Corbin Russwin DC6000 series.
 - b. Doromatic SC71 series.
 - c. LCN 4041 Series, 4011/4111 Series.
 - d. Norton 7500 series.
 - e. Sargent 351 Series, 281 Series.
 - 2. The following closers will be considered equal for medium use on interior doors:
 - a. Corbin Russwin DC3000 series.
 - c. Doromatic SC81 series
 - c. LCN 1461 series.
 - d. Norton 8501 series.
 - e. Sargent 1431 series.
- B. Size of Units: Provide non-sized closers, adjustable to meet maximum opening force requirements of ADA. Comply with manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather, and anticipated frequency of use. Where parallel arm closers are installed, provide closer unit one size larger than recommended for use with standard arms.
- C. Closers shall have adjustment operating valves for closing speed, latching speed, and backcheck control as a standard feature.
- D. Provide parallel arm or regular arm closer as required to mount closer on door face least exposed to public traffic.
- E. Provide drop plates, brackets, or adapters for arms as required to suit details or conditions.
- F. Closer covers shall be rectangular, full cover type, high impact non-corrosive, and flame retardant.
- G. Closer shall not require removal for adjustments to be made.
- H. Provide hold-open arms where indicated.

2.08 FLAT GOODS

- A. General: Flat goods shall conform to ANSI/BHMA A156.6 and the types listed in the HARDWARE GROUPS.
 - 1. The products of the following manufacturers will be considered equal subject to project conditions:
 - a. Baldwin Hardware Corporation
 - b. Burns Manufacturing Incorporated
 - c. Hager Companies
 - d. Ives Hardware
 - e. Rockwood Manufacturing Company
 - f. Trimco
- B. Door plates for single doors shall be 2-inches less than door width. Door plates for double doors shall be 1-inch less than door width. Height of plate shall be as listed but 1-inch less than bottom rail for panel doors.

2.09 STOPS AND HOLDERS

- A. General: Stops and holders shall conform to ANSI/BHMA A156.16 and the types listed in the HARDWARE GROUPS.
 - 1. The products of the following manufacturers will be considered equal subject to project conditions:
 - a. Architectural Builders Hardware MFG., Inc.
 - b. Baldwin Hardware Corporation
 - c. Burns Manufacturing Incorporated
 - d. Hager Companies
 - e. Ives Hardware
 - f. Trimco

2.10 THRESHOLDS

- A. General: Thresholds shall conform to ANSI/BHMA A156.21 and ADAAG. Provide size, thickness, and profile as listed in the HARDWARE GROUPS.
 - 1. The products of the following manufacturers will be considered equal subject to project conditions:
 - a. Hager Companies
 - b. National Guard Products
 - c. Pemko Manufacturing Co.
 - d. Reese Enterprises
 - e. Zero International

2.11 WEATHERSTRIPPING AND GASKETING

- A. General: Weather-stripping and smoke gasketing shall conform to ANSI A156.22 and the types listed in the HARDWARE GROUPS.
 - 1. The products of the following weatherstripping and gasketing manufacturers will be considered equal subject to project conditions:
 - a. Hager Companies
 - b. National Guard Products
 - c. Pemko Manufacturing Co.
 - d. Reese Enterprises
 - e. Zero International

2.12 CABINET HARDWARE

- A. General: Cabinet hardware shall conform to ANSI/ANSI A156.9 and the types listed in the HARDWARE GROUPS.
 - 1. The products of the following cabinet hardware manufacturers will be consider equal subject to project conditions:
 - a. Accuride
 - b. Grass
 - c. Julius Blum Hardware
 - d. Ives
 - e. Knap & Vogt Manufacturing Co.
 - f. Trimco
 - g. Other manufacturers as listed for similar items

2.13 FINISHES

- A. Finishes: Identified in schedule at end of Section.
 - 1. Designations used are those listed in ANSI/BHMA A156.18 "Materials and Finishes", including coordination with traditional U.S. finishes shown by certain manufacturers for their products.
 - 2. If no BHMA finish is established, match specified product.
- B. Provide matching finishes for hardware units at each door or opening to greatest extent possible, except as otherwise indicated. Reduce differences in color and textures as much as commercially possible where base metal or metal forming process is different for individual units of hardware exposed at same door or opening.

- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than specified for applicable units of hardware by referenced standards.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Pre-Installation Meeting: Before start of work under this contract, the Contractor, hardware installer, hardware manufacturer's representative or supplier, the Contracting Officer, and a user representative shall meet to review the keying system, hardware installation instructions, and installation conditions.
- B. Verify that doors and frames are ready to receive Work and dimensions are as indicated.

3.02 INSTALLATION

- A. Install each hardware item in compliance with manufacturer's instructions and recommendations.
- B. Mount hardware units at height indicated in the Door and Hardware Institute's Recommended Locations for Builders Hardware for Standard Steel Doors and Frames, except:
 - 1. As otherwise indicated or as required to comply with governing regulations.
 - 2. Mount deadbolt (if any) centerline not more than 5-inches above latchset handle centerline.
- C. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protection with finishing work. Do not install surface mounted items until finishes have been completed on the substrate.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- F. Set metal thresholds for exterior doors in full bed of butyl rubber, polyisobutylene mastic sealant, or preformed butyl-polyisobutylene sealant tape as specified under SECTION 07920 - SEALANTS.
- G. Fit face of all mortise parts snug and flush.
- H. Operating parts shall move freely and smoothly without binding, sticking or excessive clearance.
- I. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- J. Install with manufacturer's fasteners conforming to requirements of this section or those required for substrate. Expansion shields securing hardware such as door stops/holders to concrete or solid grouted masonry substrates shall completely fill the depth and diameter of the drilled holes. Shimming of the shields or using of plastic shields is not acceptable.

- K. Protect hardware from damage or marring of finish during construction. Use strippable coatings, removable tapes or other approved means.
- L. Ensure that hardware displays no evidence of finish paint after building cleanup with exception of prime coated hardware installed for finish painting. The Contractor may achieve this by sequencing installation, removing after fittings and reinstalling after painting is completed, providing protection, cleaning original hardware finish, or other approved means.
- M. Latch and Bolt: Install latch and bolt to automatically engage in keeper, whether activated by closer or manual push. In no case shall additional manual pressure be required to engage latch or bolt in keeper.
- N. Closers:
 - 1. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors...
 - 2. Carefully adjust closers to operate noiselessly and evenly.
 - 3. Have manufacturer's representative regulate closers prior to Contracting Officer's acceptance of building.
- O. Cabinet Work: Install cabinet hardware to conform to manufacturer's instructions and AWI Quality Standards, Guide Specifications and Quality Certification Program for quality of cabinet as specified.

SPECIFIER'S NOTE: Delete FIELD QUALITY CONTROL paragraph when on a few non-complicated items of finish hardware and/or remote location of project and need for certification is not required. If deleted, also delete Certification paragraph from Submittals.

3.03 FIELD QUALITY CONTROL

- A. If requested by the Contracting Officer, the Certified Architectural Hardware Consultant from door hardware supplier or manufacturer's representative shall inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified at no additional cost to the State.

3.04 ADJUST AND CLEAN

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace items which cannot be adjusted to operate freely and smoothly as intended for application made.
- B. Clean adjacent surface soiled by hardware installation.
- C. Final Adjustment:
 - 1. Clean operating items as necessary to restore proper function and finish of hardware and doors.
 - 2. Adjust door control devices to compensate for final operation of ventilating equipment.
 - 3. Lubricate bearings surface of moving parts and adjust latching and holding devices for proper function.
 - 4. Test keys in every lock for proper operation and conformance with keying system.

SPECIFIER'S NOTE: The sample hardware schedule is an example of the type of list to be created, project specific by the Project A/E.

3.05 HARDWARE GROUPS

A. Door Hardware: (SAMPLE)

MANUFACTURER LIST

<u>CATEGORY</u>	<u>VENDOR NAME</u>	<u>MFG</u>
DOOR BOTTOM THRESHOLD	BY PEMKO	PEM
WALL STOP	BY TRIMCO	TRI
HINGE	BY WWWW COMPANY	WWW
DOOR CLOSER	BY XXXX COMPANY	XXX
LOCKSET	BY YYYY COMPANY	YYY
EXIT DEVICE	BY ZZZZ COMPANY	ZZZ

HW GROUP - 001
(TYPICAL ENTRY DOORS)

3.0 EA	HINGE	Model#	WWW
1.0 EA	LOCKSET	Model #	YYY
1.0 EA	CLOSER	Model #	XXX
1.0 EA	THRESHOLD	171A	PEM

B. Cabinet Hardware:

1. Pulls: [_____]
2. Hinges: [_____]
3. Drawer Slides: [_____]
4. Adjustable Shelf Standard: [_____]
5. Adjustable Shelf Clip: [_____]
6. Door Lock: [_____]
7. Door Catch: [_____]
8. Drawer Lock: [_____]

[Note: All cabinet door and drawer locks shall be keyed alike in each room.]

END OF SECTION